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Notice of Allowability	Application No.	Applicant(s)	
	10/816,467	NISHIMURA ET AL.	
	Examiner	Art Unit	
	James J. Leybourne	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment received 22 December 2005.
2. ☒ The allowed claim(s) is/are 32-69.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☒ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
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DETAILED ACTION

1. According to the "Amendment" received 22 December 2005, the specification has been amended; claims 32, 38, 39 and 48 have been amended; and claims 1-31, have been canceled.

Drawing "Fig. 9" has been replaced by the replacement sheet provided in the amendment.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

In claim 48, in line 3, "a charged particle" was replaced by "a primary charged particle" and in lines 5, following "detecting", the phrase "the charged particle beam from the surface" was replaced with "a secondary beam of charged beam of charged particles from the surface".

3. Authorization for this examiner's amendment was given in a telephone interview with Donald Stephens Jr. on 12 January 2006.

Response to Arguments

4. Applicant's Remarks received 22 December 2005 have been fully considered and are persuasive.

Allowable Subject Matter

5. The following is an examiner's statement of reasons for allowance:

Regarding independent claim 32, the prior art fails to disclose or make obvious a method for adjusting an optical axis in an inspection apparatus that uses a charged particle beam, the method comprising:

providing the inspection apparatus with a charged-particle-beam (CPB) optical system for guiding an observation charged particle beam along the optical axis from an object to a detector, the CPB optical system including a cathode lens and an X-Y stage for holding the object;

providing self-emitting beam source on a surface of the X-Y stage;

generating an observation charged particle beam from the " self-emitting beam source for obtaining an image of the object at the detector; and

determining a position of the X-Y stage using the observation charged particle beam to adjust the optical axis.

Claims 33-37 are allowed by virtue of their dependency on claim 32.

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Regarding claim 38, the prior art fails to disclose or make obvious a method for adjusting an optical axis of the CPB optical system in an inspection apparatus that includes a charged-particle-beam (CPB) optical system having a cathode lens and including an X-Y stage for holding an object, the method comprising:

guiding a charged particle beam from the object through the optical system along the optical axis to a detector;

from an adjustment CPB source located on a surface of the X-Y stage,
generating an adjustment charged particle beam that propagates from the adjustment
CPB source to the detector and produces an image of the object at the detector; and
determining a position of the X-Y stage using the adjustment charged particle
beam to adjust the optical axis.

Regarding independent claim 39, the prior art fails to disclose or make obvious a method for aligning an inspection apparatus, comprising:

using a first optical system, guiding a first energy beam from a specimen to a first detector along a first optical axis;

using a second optical system, guiding a second energy beam from the specimen to a second detector along a second optical axis;

obtaining an image of a pattern to measure a location of the specimen relative to
the second optical axis and a distance of the specimen to the second optical axis;

determining a baseline from the distance between the first and second optical
axes; and

using the baseline, aligning an evaluated area of the specimen to the first optical axis to align the specimen with respect to the first optical axis.

Claims 40-47 are allowed by virtue of their dependency on claim 39.

Regarding independent claim 48, the prior art fails to disclose or make obvious a charged-particle-beam (CPB) apparatus, comprising:

an irradiation-optical system having a respective optical axis and being situated and configured for guiding a charged particle beam from a beam source to a surface of a specimen on a stage;

a detection-optical system situated and configured for detecting the charged particle beam from the surface and for producing an image of the surface, the detection-optical system and irradiation-optical system being situated in a vacuum environment;

a beam deflector provided in at least one of the irradiation-optical system and detection-optical system; and

an off-axis optical system having an optical axis situated at a predetermined distance from the axis of the irradiation-optical system, the off-axis optical system being configured to illuminate the specimen with an optical alignment beam passing from outside the vacuum environment through a window and through an objective lens situated in the vacuum environment so as to align the specimen with the axis of the irradiation-optical system.

Claims 49-58 are allowed by virtue of their dependency on claim 48.

Regarding claim 59, the prior art fails to disclose or make obvious a method for measuring an off-axis distance in an apparatus including a specimen stage, a charged-particle-beam (CPB) optical system having a main optical axis, and an off-axis optical system having a respective optical axis, the method comprising:

providing a first pattern on the specimen stage;

obtaining a first image of the first pattern using the off-axis optical system;

providing a second pattern at a known distance from the first pattern;

obtaining a second image of the second pattern using the CPB optical system;

and

determining a distance between the main optical axis and the optical axis of the off-axis optical system based on the first and second images.

Regarding independent claim 60, the prior art fails to disclose or make obvious a method for measuring an off-axis distance between a main optical axis, and an off-axis optical system in a CPB optical system, the method comprising:

providing a first pattern on the specimen stage;

obtaining a first image of the first pattern using the off-axis optical system;

measuring a first stage position when obtaining the first image;

using the CPB main optical system, obtaining a second image of a pattern on the specimen stage, the pattern being either the first pattern or a second pattern

situated a known distance from the first pattern;

measuring a second stage position when obtaining the second image; and
determining a distance between the main optical axis and the optical axis of the off-axis optical system based on the first and second images and the respective first and second stage positions.

Claims 61-64 are allowed by virtue of their dependency on claim 60.

Regarding independent claim 65, the prior art fails to disclose or make obvious a method for evaluating a specimen with an image obtained using a charged particle beam, the method comprising:

using an off-axis optical system, obtaining an image of a pattern provided on the specimen;
while obtaining the image, measuring a position of a stage holding the specimen;
reading or measuring a stag-position baseline', and
calculating a target stage position from the obtained image, measured stage position, and baseline, and
moving the stage toward the target stage position.

Claims 66 and 67 are allowed by virtue of their dependency on claim 65.

With respect to the independent claim 68, the prior art fails to disclose or make obvious a method for adjusting the optical axis in a CPM inspection apparatus that comprises a stage for mounting a specimen a charged-particle-beam (CPB) source for generating a charged particle beam from a surface of the specimen, a CPB detector for

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detecting the charged beam, and a deflector situated between the stage and the CPB detector the method comprising:

generating a charged particle beam from the CPB source so as to cause the charged particle beam to be generated from the surface of the specimen;

obtaining a first image of the specimen by detecting the charged particle beam while not applying a voltage to the deflector;

obtaining a second image of the specimen by detecting the charged particle beam while applying a voltage to the deflector; and

setting the voltage applied to the deflector based on the first and second images, so as to adjust the optical axis.

Claim 69 is allowed by virtue of its dependency on claim 68.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance"


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James J. Leybourne whose telephone number is 571 262-2478. The examiner can normally be reached on M_F 10:00AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on 571 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

January 12, 2006
JJL


NIKITA WELLS
PRIMARY EXAMINER 01/17/06